Ecological Site Description ID:	F231XY118AK

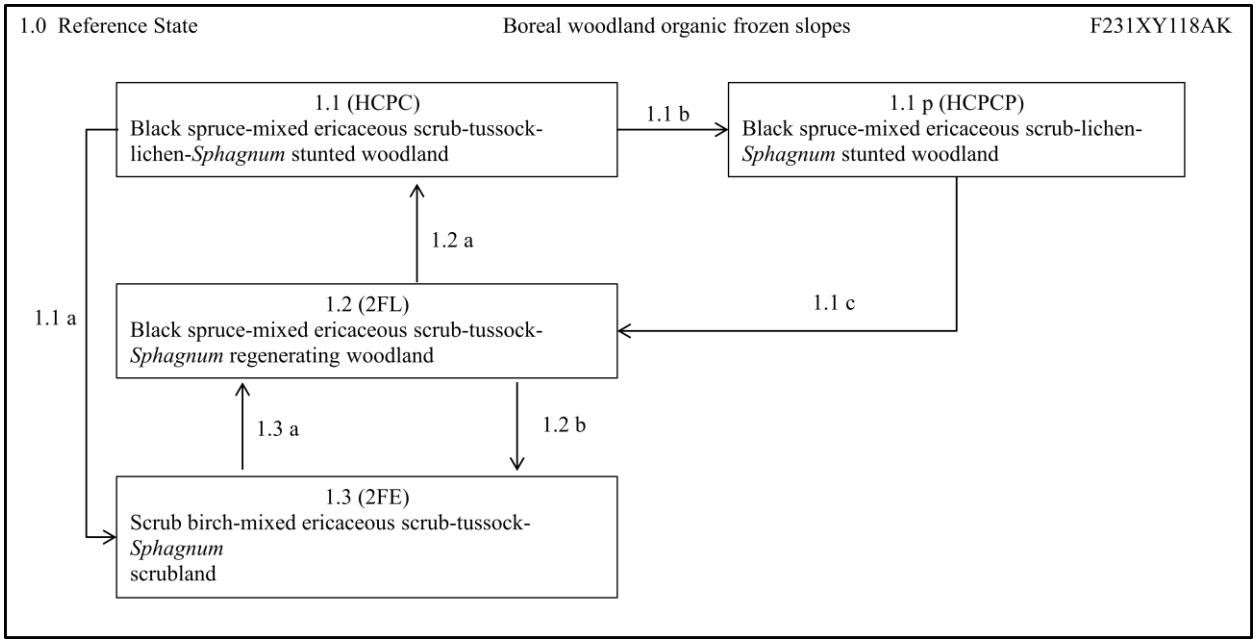
Ecological Dynamics of the Site:

This boreal ecological site occurred on steep backslopes, toeslopes, and footslopes of mountains at all aspects. Given the wide array in landscape position for this ecological site, slope varied substantially (i.e. 1-78%). For the climax phase community, organic mat ranged from 10-70 cm and soils had shallow permafrost. Soils were uniformly saturated and ponded water was often observed at sampled plots. For community phase 1.1, soils were classified as histoturbels or fibristels and were composed of organic matter over silty cryoturbate. The climax phase community was characterized as stunted black spruce woodland with tussock forming grasses and thick *Sphagnum* mats.

Fire was a disturbance regime that resulted in 4 documented phases. Fire is a natural and typically unmanaged disturbance regime. The typical fire return interval for coniferous forests of interior Alaska is approximately 100 years. For this ecological site, low-severity fire events are more typical then high-severity fire events. Low-severity and high-severity fire events appear to cause differences in the depth of organic material on the soil surface, presence and/or depth of permafrost, present vegetation, and potential vegetation.

It was presumed that sites void of fire for long stretches of time eventually become dominated by *Sphagnum* moss mats. Organic material becomes so thick and has enough moisture so that a fire event may not reset the community to an early fire sere (i.e. phase 1.3). Sampled communities dominated by *Sphagnum* mats have a less productive black spruce forest and as a result were considered post-climax for this ecological site.

State and Transition Diagram:



State ID Number:	1	State Name:	Reference
State Narrative:	Phases within the reference state were grouped on the structure and dominance of deciduous and coniferous trees which was believed to directly relate to time since last fire event and severity of burn. In a low-severity fire, minimal proportions of the organic mat are consumed and mineral soils will typically not be exposed. Permafrost typically remains in the soil profile, which often perches water. Graminoids and scrubs quickly recolonize and dominate a site using below ground root reserves that were not consumed in the fire event. Due to their semi-serotenous cones, black spruce quickly reestablishes after fire events. With the absence of fire, early fire sere communities associated with this disturbance regime are thought to progress to community phase 1.2. The fire return interval plays a large role in the structure of the observed forest. Longer fire return intervals favors development of community phases 1.1, while shorter fire return intervals favor development of community phases 1.2 and 1.3. Tall trees are defined as trees growing >40’ in height, medium trees are defined as growing 15-40’ in height, while stunted and regenerative trees are defined as growing less than 15’ in height. Tall shrubs are defined to grow greater than 10’ in height, medium shrubs are defined to grow 3-10’ in height, low shrubs are defined to grow 8” – 3’ in height, and dwarf shrubs are defined to grow less than 8” in height.		

Photo 1.1	

Community Phase Number:	1.1	Community Phase Name:	Black Spruce-Mixed Ericaceous Scrub-Tussock-Lichen-*Sphagnum* Stunted Woodland

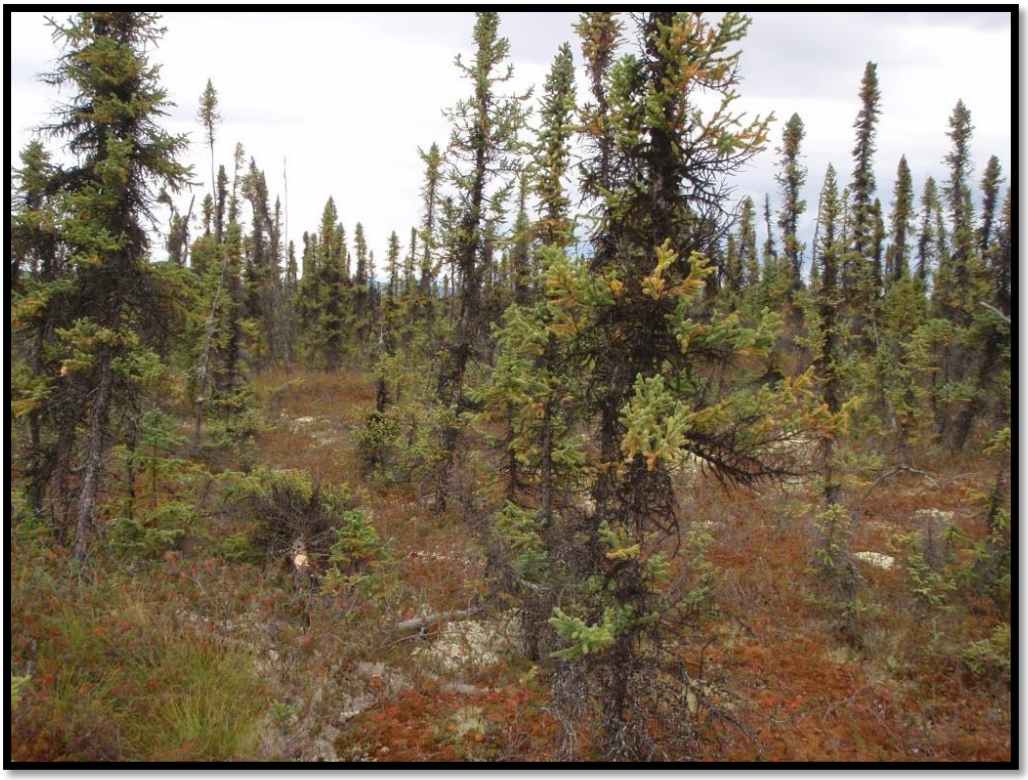
Community Phase Narrative:

The majority of tree cover occurred in the stunted tree stratum (total mature tree cover ~20%). *Picea mariana* was the dominant tree species. The majority of shrub cover occurred in the low and dwarf stratums (total shrub cover ~50%). Commonly observed shrub species include *Betula nana*, *Ledum palustre*, *Rubus chamaemorus*, *Vaccinium oxycoccos*, and *Vaccinium vitis-idaea*. Graminoids were common (~20% cover) especially tussock forming species like *Eriophorum vaginatum* and *Carex bigelowii*. Forbs were minor vegetative component. Moss (~60%) and lichen (25%) combined to form an expansive ground cover. *Sphagnum* moss was abundant (~40% cover).

Community Pathways

Pathway Number	Pathway Name & Description
1.1 a	Fire. For this ecological site, phase 1.1 has a shorter fire return interval then phase 1.1 p and a longer fire return interval then phase 1.2.

1.1 b	Normal time and growth without fire disturbance. *Sphagnum* moss overtops tussocks and dominate understory. Surface organic matter increases and ranged between 41 and 90 cm thickness. As a result, sites get wetter and become less productive.

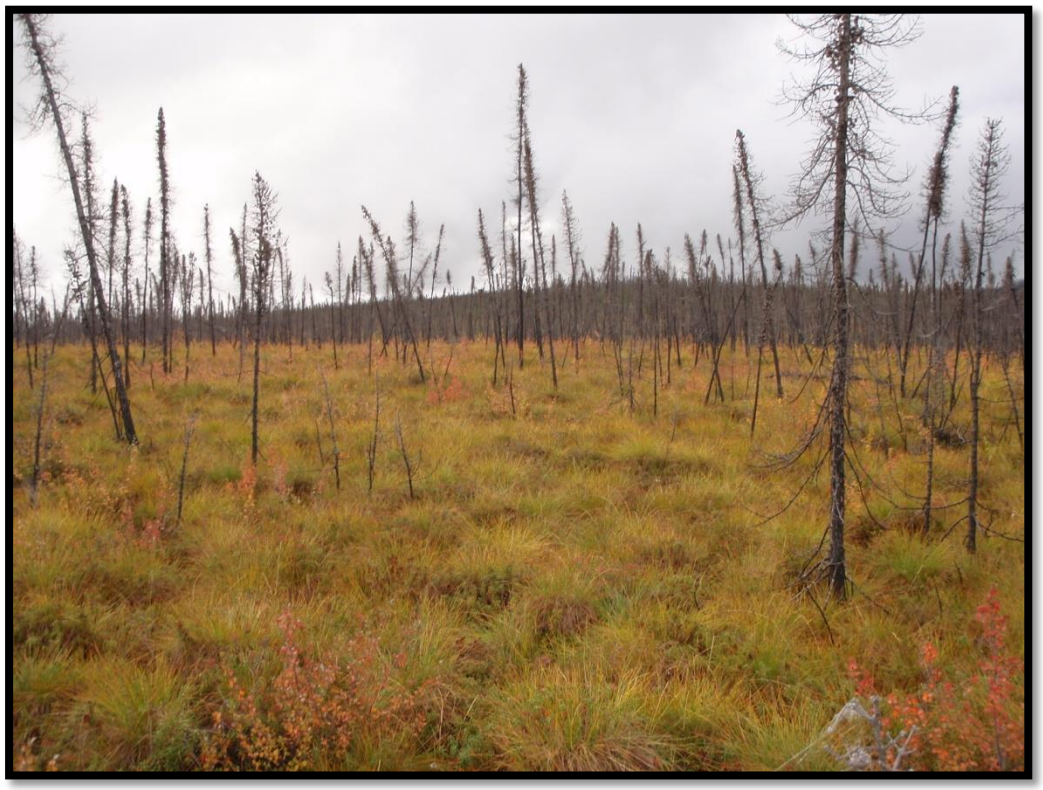
Photo 1.1 p			
Community Phase Number:	1.1 p	Community Phase Name:	Black Spruce-Mixed Ericaceous Scrub-Lichen-*Sphagnum* Stunted Woodland
Community Phase Narrative:			
The majority of tree cover occurred in the stunted and regenerative tree stratums (total mature tree cover ~12%). *Picea mariana* was the dominant tree species. The majority of shrub cover occurred in the low and dwarf stratums (total shrub cover ~50%). Commonly observed shrub species include *Ledum palustre* and *Rubus chamaemorus*. Graminoids and forbs are minor vegetative components. Moss (~80%) and lichen (20%) combined to form an expansive ground cover. *Sphagnum* moss was abundant (~75% cover).			
Community Pathways			

Pathway Number	Pathway Name & Description
1.1 c	Fire. Post-climax sites have such thick organic matter that fire does not create conditions for competitive release of graminoids and shrubs (as was observed in phase 1.3). Fire creates a limited flush of black spruce seedlings but significant time without fire must elapse for development of woodland. The transition results in a community that is dominated by scrubs and *Sphagnum*.

Photo 1.2			
			
Community Phase Number:	1.2	Community Phase Name:	Black Spruce-Mixed Ericaceous Scrub-Tussock-*Sphagnum* Regenerating Woodland
Community Phase Narrative:			
In this community phase, remnants of charred trees were often observed. The majority of tree cover occurred in the regenerative tree stratums (total mature tree cover ~10%; regenerative tree cover ~20%). *Picea mariana* was the dominant tree species. The majority of shrub cover occurred in the low and dwarf stratums (total shrub cover ~60%). Commonly observed shrub species include *Ledum palustre*, *Rubus chamaemorus*, *Vaccinium oxycoccos*, and *Vaccinium vitis-idaea*. Graminoids were common (~25% cover) especially tussock forming species like *Eriophorum vaginatum* and *Carex bigelowii*. Forbs were minor vegetative component. Moss (~65%) and lichen (15%) combined to form an			

expansive ground cover. *Sphagnum* moss was abundant (40% cover).

Community Pathways	
Pathway Number	Pathway Name & Description
1.2 a	Fire.
1.2 b	Normal time and growth without fire. As a result, black spruce seedlings mature and eventually develop into a woodland. Shrub and graminoid cover decreases, while *Sphagnum* cover increases. The fire return interval was presumed to be shorter then phase 1.1 but longer than phase 1.3.

Photo 1.3			
Community Phase Number:	1.3	Community Phase Name:	Scrub Birch-Mixed Ericaceous Scrub-Tussock-*Sphagnum* Scrubland
Community Phase Narrative:			
In this community phase, standing charred trees were often observed. The majority of tree cover			

occurred in the regenerative tree stratums (total mature tree cover ~1%; regenerative tree cover ~8%). *Picea mariana* was the dominant tree species. The majority of shrub cover occurred in the low and dwarf stratums (total shrub cover ~75%). Commonly observed shrub species include *Betula nana*, *Ledum palustre*, *Rubus chamaemorus*, *Vaccinium oxycoccos*, and *Vaccinium vitis-idaea*. Graminoids were common (~50% cover) especially tussock forming species like *Eriophorum vaginatum* and *Carex bigelowii*. Forbs and lichen were a minor vegetative component. *Sphagnum* moss was an abundant ground cover.

Community Pathways	
Pathway Number	Pathway Name & Description
1.3 a	Normal time and growth without fire. Black spruce and *Sphagnum* cover increases, while shrub and graminoid cover decreases.